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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,941	11/16/2001	Katarina Dahl	024444-983	7925

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EXAMINER

CADUGAN, ERICA E

ART UNIT PAPER NUMBER

3722

DATE MAILED: 01/27/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,941

Applicant(s)

DAHL ET AL.

Examiner

Erica E Cadugan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Faxing of Responses to Office Actions

1. In order to reduce pendency and avoid potential delays, TC 3700 is encouraging FAXing of responses to Office Actions directly into the Group at (703) 872-9306. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into TC 3700 will be promptly forwarded to the examiner.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Sweden on November 22, 2000. It is noted, however, that applicant has not filed a certified copy of the Swedish application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 4,961,757 (Rhodes et al.).

Rhodes et al. teaches the dry milling of gray cast iron (see col. 7, lines 30-48, and particularly lines 30, 36, and 37). Merriam Webster's Collegiate Dictionary, 10th ed., defines the term "composite" as "made up of distinct parts". As evidenced by the ASM Handbook, Vol. 20, Materials Selection and Design, page 378, right column, in gray cast iron, "graphite flakes are a predominant microstructural feature", and thus gray cast iron is a "composite" containing the

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“distinct parts” of iron and graphite flakes. Further note that Rhodes teaches such dry milling using silicon-nitride inserts (see col. 7, line 38, and also lines 55-56, and generally lines 30-62, for example).

The range of cutting speeds set forth in claim 3 is 1100 m/min - 2500 m/min, which converts to a range of 3609 ft/min - 8202.1 ft/min. As shown in col. 7, lines 30-31, Rhodes teaches performing such milling at a speed of 6000 ft/min, which is within the claimed range.

Additionally, the range of cutting depths set forth in claim 3 is 0.2-2mm, which converts to a range of 0.007874 inches to 0.07874 inches. As shown in col. 7, line 33, Rhodes teaches performing such milling at a cutting depth of 0.050 inches, which is within the claimed range.

Claim Rejections - 35 USC § 103

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 4,961,757 (Rhodes et al.) as applied to claim 3 above.

Rhodes teaches all aspects of the claimed invention as described in the above rejection based thereon. However, it is noted that the range in claim 4 of 0.3-1.0 mm of cutting depth converts to 0.0118 inches to 0.0394 inches. While Rhodes does teach milling at various cutting depths (0.050 inches as shown in col. 7, lines 33 and 44, and 0.040 inches as shown in col. 6, lines 20-35, for example), Rhodes does not specifically set forth milling at a depth within the range claimed in claim 4.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the cutting depth whatever value was desired or expedient, since it has been held that where the general conditions of a claim are disclosed in the prior art,

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discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 5,655,860 (Oles).

Oles teaches the milling of a bi-metallic engine block comprising aluminum and cast iron (col. 4, lines 52-62). Milling conditions for one of the tests that yielded desirable results (e.g., no burr) included dry milling (col. 6, line 26) with a silicon nitride milling insert (col. 5, lines 45-65) at a speed of 3500 feet per minute, feeding at 0.008 inches per tooth, and at a depth of cut of 0.070 inches (col. 6, lines 16-29). Note that the presently-claimed metric ranges of claim 1 convert to the following English units:

1000-3000 m/min is equal to a range of between 3280.84 ft/min. and 9842.52 ft/min;

0.05-0.5 mm/tooth is equal to a range of between 0.001969 inches and 0.019685 inches;

0.2-2mm is equal to a range of between 0.007874 inches and 0.07874 inches.

Thus, Oles' speed, feed, and depth of cut are within the claimed ranges.

Regarding claim 2, Oles is silent with respect to the value of the chip thickness produced by the insert. However, note that if all the other cutting conditions of Oles fall within the ranges claimed in the present invention, i.e., particularly depth of cut, **inherently**, the chips produced by Oles' insert will be produced with a thickness within the range set forth in claim 2. Note that if Oles' cutter cuts at a depth of cut that falls within the claimed range, the cutting edge is located at a location within the workpiece that is going to produce chips of thicknesses that are within the range of claim 2.

However, regarding claims 1 and 3, it is noted that the silicon nitride cutting insert taught by Oles is located in the “wiper” position (col. 5, lines 47-51, for example), and is thus positioned so as to have cutting edges that project from the forward face of the milling head a distance less than those of the other “milling” inserts, which “milling” inserts are not made of silicon nitride (col. 4, lines 39-51 and col. 5, lines 45-47 and 5-7, for example). Thus, the “wiper” inserts as described by Oles are used to remove less material than the “milling” inserts made of material other than silicon nitride, and thus Oles does not explicitly teach the step of advancing a milling cutter that has a silicon nitride based milling insert relative to the material such that “at least the majority of material removal is accomplished by contact with the milling insert” as set forth in claim 1.

However, it is noted that Oles does not limit their described “milling insert” (hereinafter called the “primary insert” to avoid confusion with the presently-claimed “milling insert”) which does perform the majority of the cutting to being of any particular material, as it is noted that Oles teaches examples where the primary inserts are made different materials, such as “diamond film coated carbide inserts” (col. 5, lines 5-7 and 45-47) “polycrystalline diamond” (col. 5, lines 8-9, for example), and further teaches that “[a]lthough the milling insert of the specific embodiment has a thin diamond film thereon, there is no intention to limit the scope of the invention to this specific type of milling insert” (col. 3, line 66 through col. 4, line 2). It is additionally noted that the described “wiper” inserts taught by Oles are not limited to being made of any particular material, since Oles provides examples of milling performed with wipers of different materials, such as polycrystalline diamond (col. 4, lines 21-28 and col. 5, lines 30-45, for example) and silicon nitride (col. 5, lines 45-65, for example). It thus appears that the only

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limitations placed by Oles on the material of the cutting inserts (both primary and wiper) are that for a particular time of milling, the material of the primary inserts should be different from that of the wiper inserts (see col. 4, lines 39-51, and also col. 5, noting that Test no. 3 used primary and wiper inserts of the same material and had undesirable burr formation, see also claim 1 of Oles, for example). Furthermore, it is noted that all of the milling performed by Oles with the various tests utilizing inserts of various materials was performed on the bi-metallic aluminum and cast iron composite workpiece (col. 4, lines 58-62) and that all such milling was performed under the same milling conditions, which fall within the claimed ranges as described above (see col. 6, lines 16-29).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized whatever known cutting tool material for the cutting inserts in both the milling and wiper positions to have performed the milling operation on the bi-metallic workpiece under the conditions described by Oles as was desired or expedient to an end user, so long as the materials of the primary and wiper inserts were different in accordance with Oles' teaching, and thus specifically to have substituted known cutting tool material silicon nitride for the materials explicitly taught by Oles for the primary inserts and to have substituted some other different known cutting tool material for the materials of the wiper inserts explicitly taught by Oles (or to have just used the polycrystalline diamond wiper inserts explicitly taught by Oles), since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. See also *Ballas Liquidating Co. v. Allied industries of Kansas, Inc.* (DC Kans) 205 USPQ 331.

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Regarding claims 3-4, Oles teaches all aspects of the claimed invention as described in the above rejection based thereon. However, the cutting speed specifically taught by Oles is 3500 feet per minute, and the depth of cut specifically taught by Oles is 0.070 inches. The range of cutting speeds set forth in claim 3 is 1100 m/min - 2500 m/min, which converts to a range of 3609 ft/min - 8202.1 ft/min. The range of cutting depths set forth in claim 4 is 0.3-1.0 mm, which converts to 0.0118 inches - 0.0394 inches.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a cutting speed (claim 3) and depth of cut (claim 4) in whatever range was desired or expedient, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Conclusion

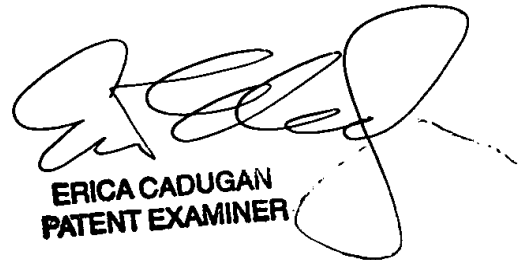
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica E Cadugan whose telephone number is (703) 308-6395. The examiner can normally be reached on M-F, 7:30 a.m. to 5:00 p.m., alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea L. Wellington can be reached on (703) 308-2159. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.



ERICA CADUGAN
PATENT EXAMINER

eec
January 23, 2004